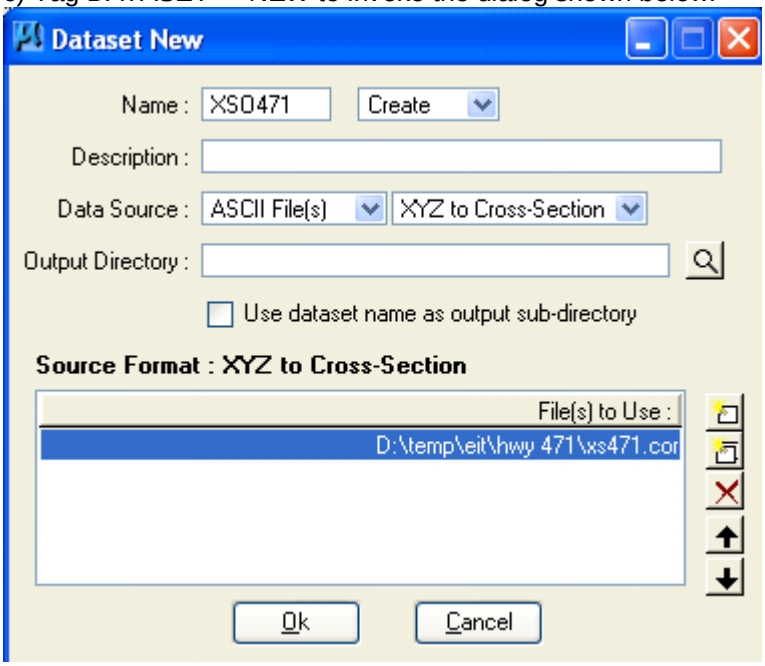
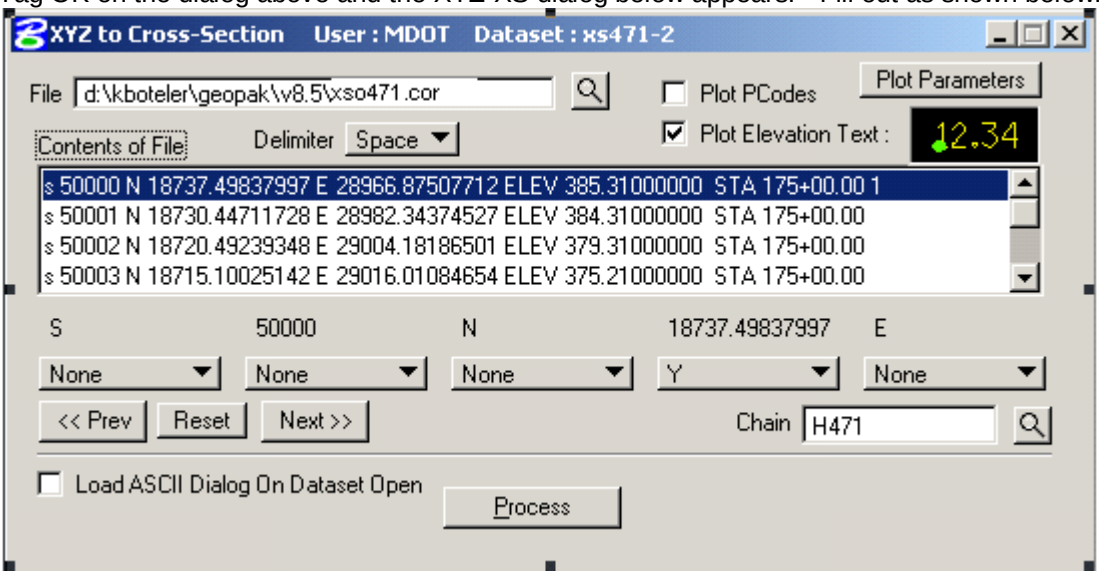
Final EW from XS (1-1-2012)

1. Processing Original X-Sections (In xso471.dgn)

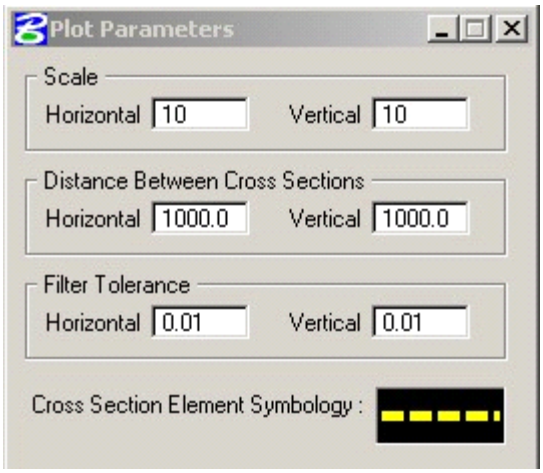
a) Create a XS design file (Use XSSEED.DGN) called XSOchainname.dgn (i.e. xso471.DGN) and enter this DGN file.
b) Tag PROJECT -> OPEN and open the project if you have already created a Project. If you have not already created GeoPak project, Tag Project NEW and enter a project name (i.e. 471) and select your job number.
c) Tag DATASET -> NEW to invoke the dialog shown below.



d) Tag OK on the dialog above and the XYZ-XS dialog below appears. Fill out as shown below.



Plot Parameters: LV=XS_X_GROUND,CO=bylevel,LC=bylevel,WT=bylevel.

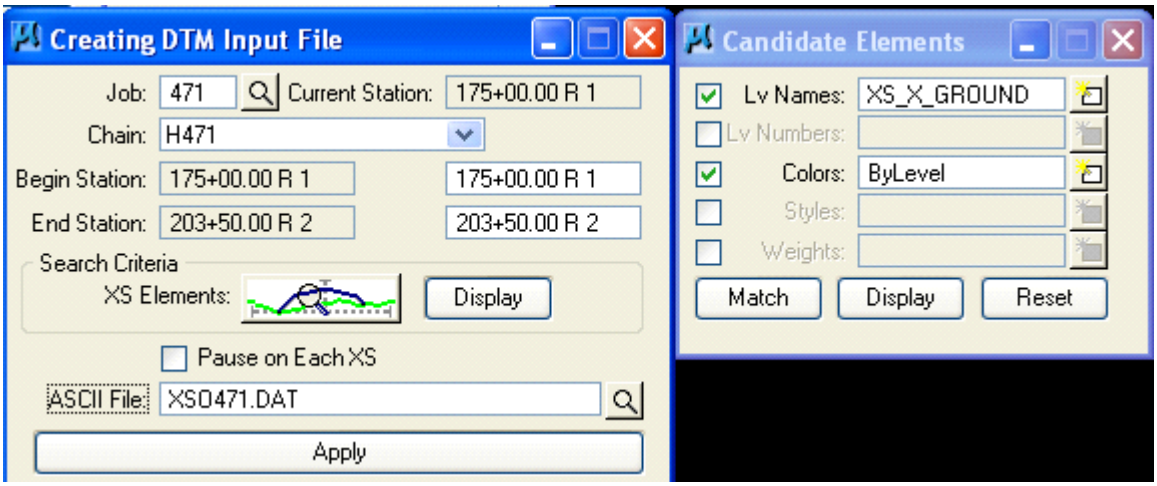


Tag the **PROCESS** button. X-sections will be added to your design file. If you are prompted a question about decimal places, enter 0.

2. Creating A DTM (TIN) of the Original Sections

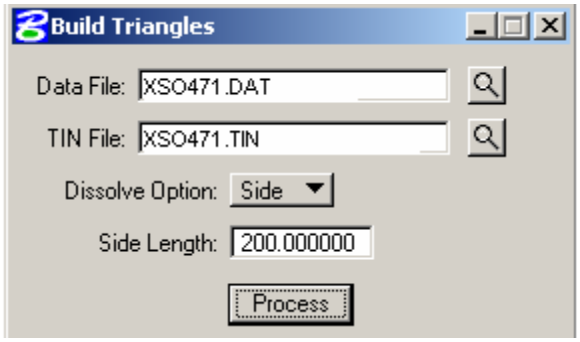
This step is done so that you can have original sections at all final x-section locations. You need to create a DTM (Digital Terrain Model) from your original sections and extract original x-sections at the stations of the finals. This will interpolate between the two adjacent x-sections. Steps are also provided below to easily determine the stations you have finals where there are no originals.

a) In the Original XS DGN File (xs471.dgn) go to Geopak's **XS Report** dialog. Tag on **DTM Input.** Fill in the fields with the information that meets your job requirements. Tag **Apply** when you have completed the information. This will create the file *.dat which will contain the XYZ coordinates of each shot of the x-sections.



b) Invoke Geopak's **DTM** application. *(Applications>Geopak Road>other components>DTM)* Tag on *Build>Triangles.*

a) Fill in the *Data File* field with the *.dat file that was created in Step 1. (ie. orampc.dat)
b) Fill in the *TIN File* field with the name of the *.tin file that you want Geopak to create. (ie orampc.tin)
c) Make sure the *Dissolve Option* is set to **Side.**
d) For the *Side Length* enter 2 X's normal distance b/t cross sections (ie. 2 X 100 = 200)
e) Tag **Process** to build the triangles and create the *tin file.



c) Go to DTM tools and Load this DTM in a 3D DGN file. Use the DTM camera to make sure the TIN looks adequate.

3. Processing of Final X-Sections

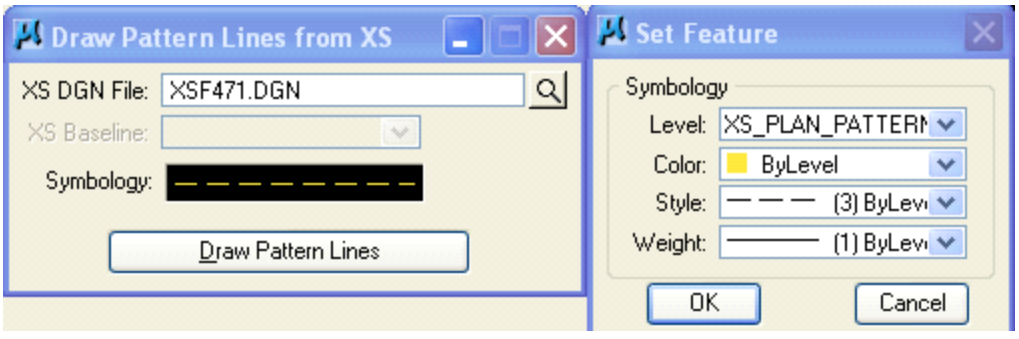
a) Create a XS design file (Use XSSEED.DGN) called XSFchainname.dgn (i.e. XSF471.DGN) and enter this DGN file.
b) Go through the same steps as shown in stape 1 except use your final x-section notes. Change the names of the Dataset created to XSFchainame (i.e. XSF471)
Also set your *Cross Section Element Symbology to LV=31(XS_P_FINSHED_GRADE), CO = 1, WT = 4, LC = 0* here for final x-sections.

4. Drawing Pattern Lines

a) Create a 2D DGN file called PATFchainname.dgn (i.e. PATF471.DGN) and enter this DGN file.

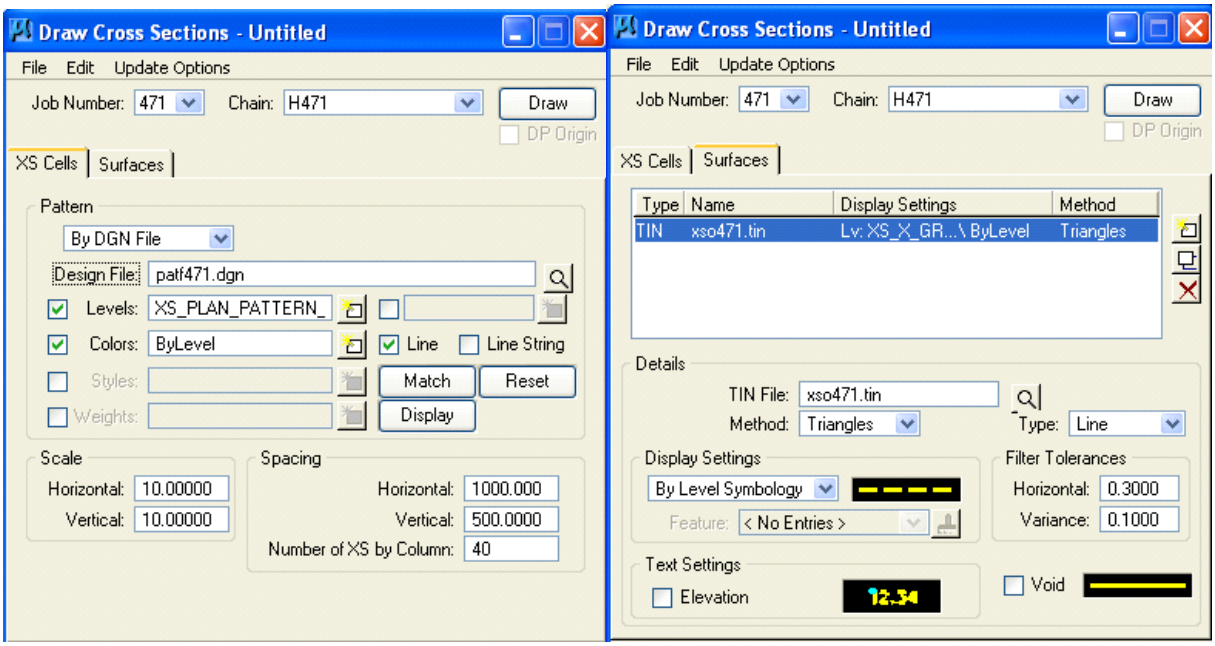
b) Invoke Draw Pattern From XS and fill out as shown below.

c) Tag Apply and Pattern lines of your Final X-Sections are created.



5. Re-Creating the Original X-Sections in your Final XS DGN

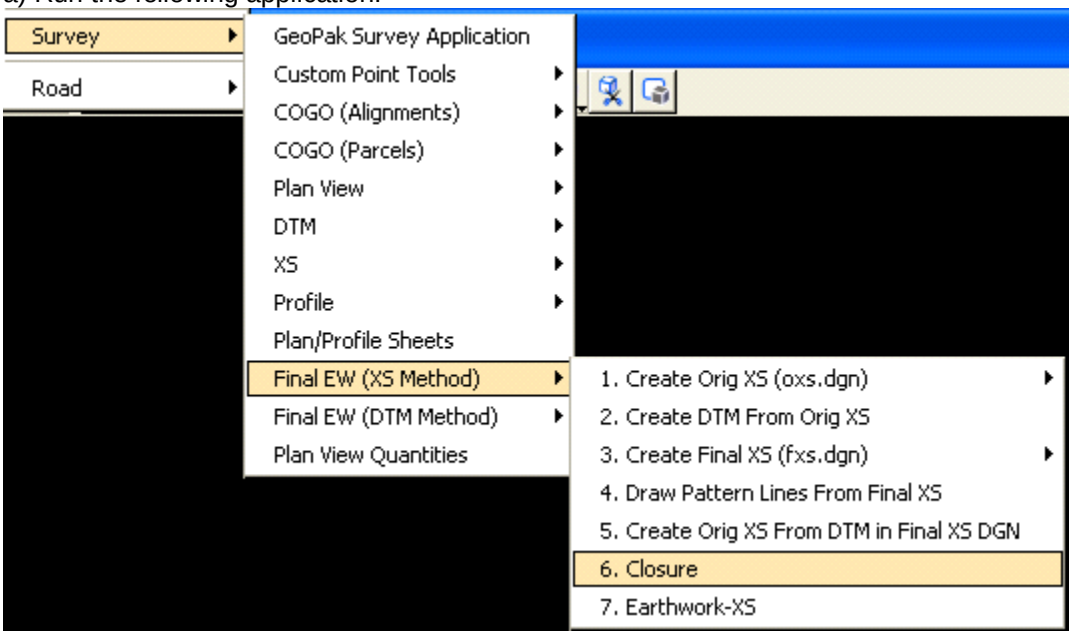
1) Enter your Final X-Section DGN file (i.e. XSF471.DGN) and invoke Draw X-Section from DTM.
2) Fill out the Dialog as shown below and then tag DRAW to place Original X-Sections on your Final Sections.



6. Closure

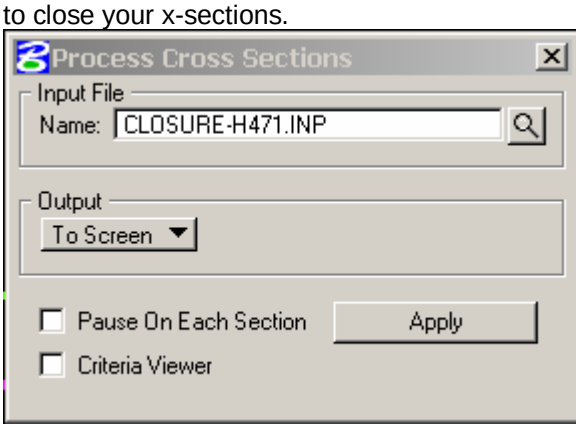
Obviously there will be vertical gaps between Original & Final cross sections at the locations where they theoretically tie. These have to tie prior to running Earthwork and checks need to be made to ensure that excessive gaps do not exist. This closure application will tie the final elements to the original elements with a vertical line. The acceptable tolerance between the final and the original at the location that they are suppose to tie is 0.3 m (1 ft). If the tie is outside the tolerance, the error should be investigated and possibly corrected in the field and reprocessed.

a) Run the following application:



This step creates an Input file (CLOSURE-chainname.inp) which actually performs the closure.

b) In the Process Cross Sections dialog, choose the Input file created in the previous step and tag Apply to close your x-sections.



3) After the closure has run, edit the CLOSURE-chainname*.log file that it created. (ie. CLOSURE-H471.log)

It will show any locations that have a vertical gap greater than 1'
STA OFFSET GAP
194+50.00, -75.45, 5.47

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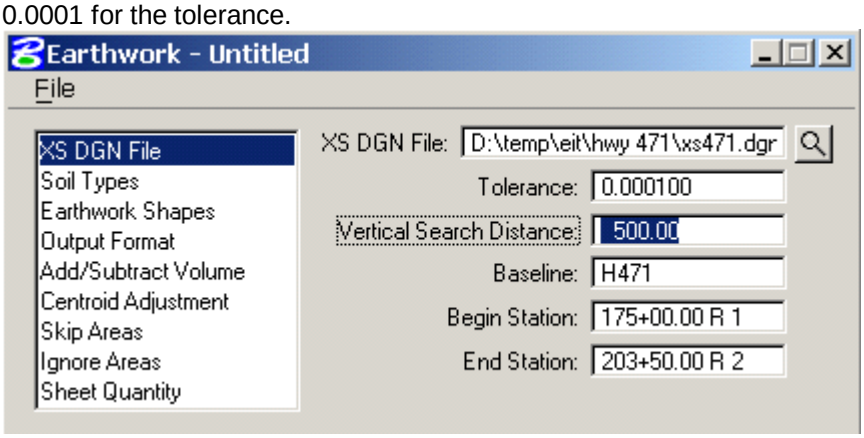
7. Earthwork - XS

In Order for Geopak to calculate earthwork correctly, you **must** insure:

* **The final ties to the original (see chapter on Closure)**
* **You don't have duplicate lines of the same symbology on top of each other.**
* **The final doesn't tie to the exterior limits of the original. If this is the case Geopak will calculate the end area as double of what it should be. You can extend the Original some to overcome this problem.**

A) Invoke the **Earthwork** dialog.
B) Tag on **XS DGN File** in the dialog box and fill out the fields to meet your job specifications. Key in 0.0001 for the tolerance.

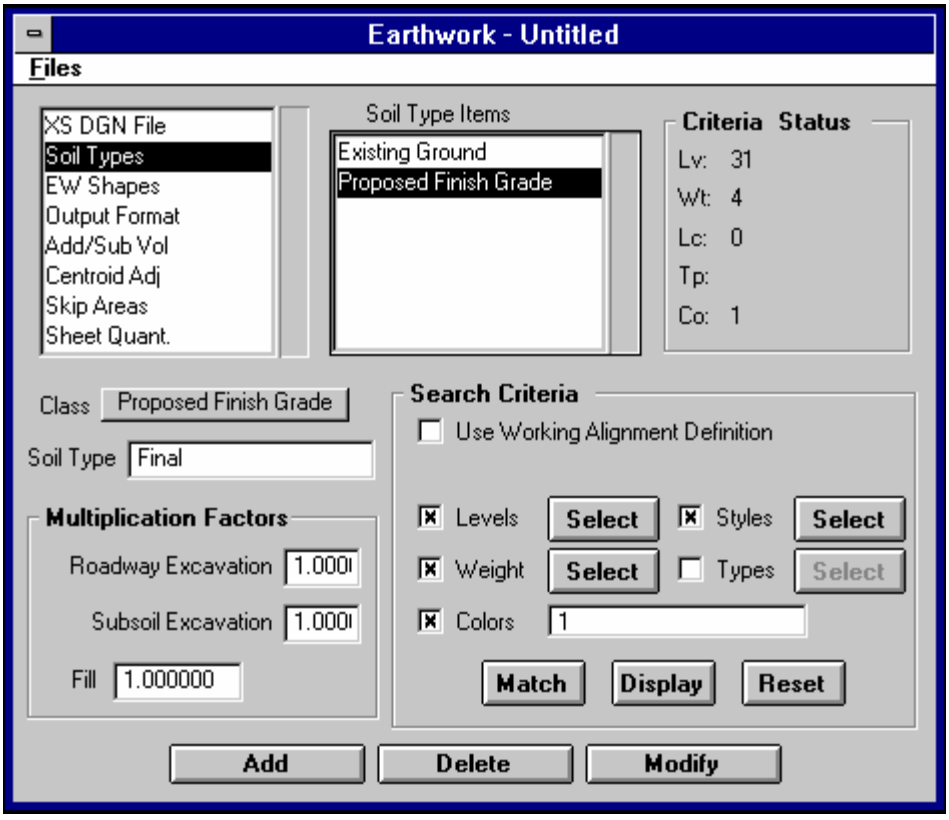


C) Tag on **Soil Type** in the dialog box.

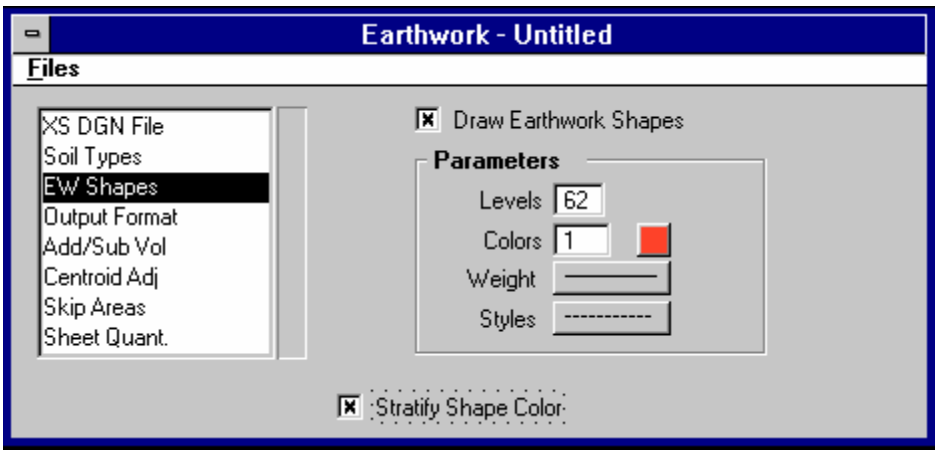
a) Set the *CLASS* to **Existing Ground** and enter **Original** next to *SOIL TYPE*
b) Set all *Multiplication Factors* to **1.000**
c) Under the *Search Criteria* set your levels, weights, colors, etc. to match your original.
(ie. LV=1(XS_X_GROUND), WT=4, LC=3, CO=2)
d) Tag **Add** to add this soil type to the *Soil Type Items* field.

D) Tag on **Soil Type** in the dialog box.

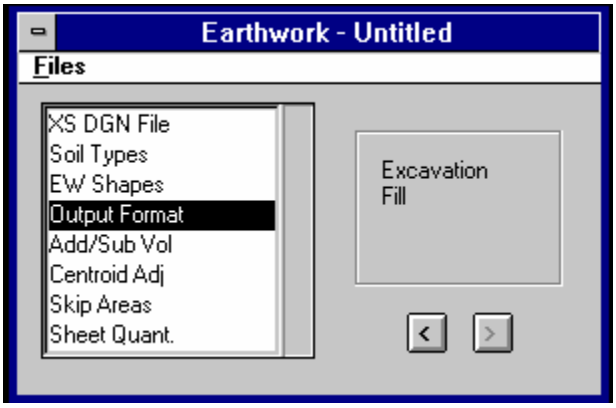
a) Set the *CLASS* to **Proposed Finish Grade** and enter **Final** next to *SOIL TYPE*
b) Set all *Multiplication Factors* to **1.000**
c) Under the *Search Criteria* set your levels, weights, colors, etc. to match your final grade.
(ie. LV=31(XS_P_FINISHED_GRADE), WT=4, LC=0, CO=1)
d) Tag **Add** to add this soil type to the *Soil Type Items* field.



E) Tag on **EW Shapes** and fill in the fields similar to the one shown below (Level Name for Shapes – XS_M_SHAPES_EARTHWORK):


Earthwork - Untitled
Files
XS DGN File
Soil Types
EW Shapes
Output Format
Add/Sub Vol
Centroid Adj
Skip Areas
Sheet Quant.
Draw Earthwork Shapes
Parameters
Levels 62
Colors 1
Weight
Styles
Stratify Shape Color

F) Tag on **Output Format**. Click on the arrows, until it appears like the example below:

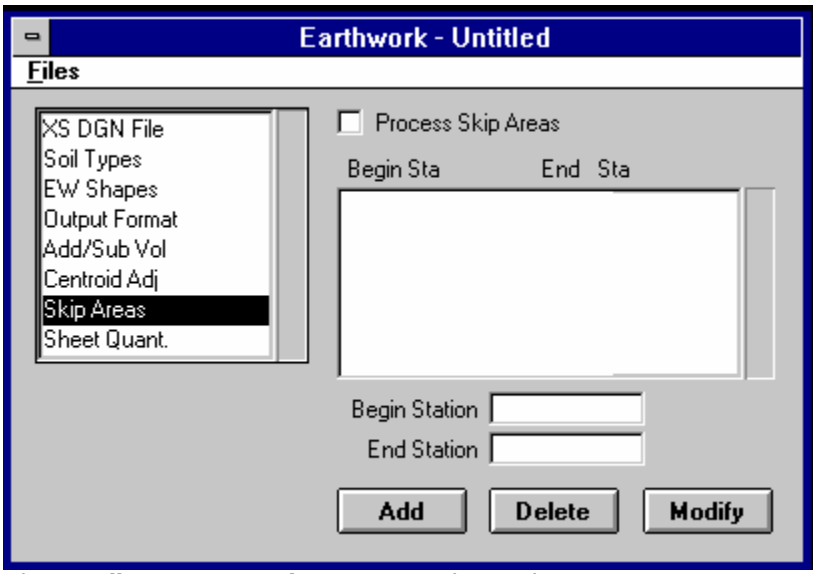


G) Tag on **Skip Areas** only if you have station ranges that you do not need the earthwork values calculated.

(ie. Bridge stations) Key in the beginning station that you want to skip. Then key in the ending station that

you want to skip. Tag **Add** and make sure that the *Process Skip Areas* has been turned on.

NOTE: YOU MUST SKIP FROM AND TO STATIONS THAT HAVE A FINAL & AN ORIGINAL SECTION



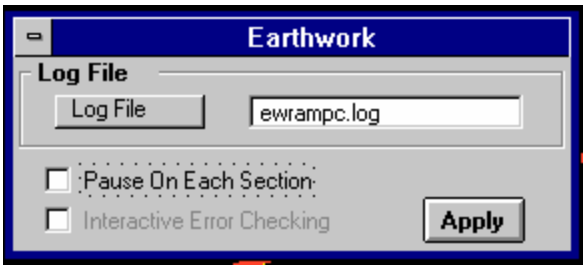
H) Tag **Files>Save Settings** to save the settings.

I) Tag **Files>Run** to process your earthwork.

J) This will pop up the **Earthwork** dialog box. Under *Log File* set the toggle to **Log File** and enter the name

of the file you want it to create. (ie. ewrampc.log)

K) Tag **Apply**



EWchainname.LOG

L) Below is an example of the *.log file created by Geopak.

Station	Material Name	End Areas (square meters)	Unadjusted Volumes (cubic meters)	Adjusted Volumes (cubic meters)	Mult Factor	Mass Ordinate
0+000.00	ORIGINAL					
	Excavation	0.95	0	0	1.00	
	Fill	0.00	0	0	1.00	0
	FINAL					
	Excavation	0.00	0	0	1.00	
	Fill	9.93	0	0	1.00	0
0+020.00	ORIGINAL					
	Excavation	2.27	32	32	1.00	
	Fill	0.00	0	0	1.00	32
	FINAL					
	Excavation	0.00	0	0	1.00	
	Fill	6.85	168	168	1.00	-136
0+040.00	ORIGINAL					
	Excavation	1.63	39	39	1.00	
	Fill	0.00	0	0	1.00	-97
	FINAL					
	Excavation	0.00	0	0	1.00	
	Fill	1.16	80	80	1.00	-177
0+060.00	ORIGINAL					
	Excavation	1.94	36	36	1.00	
	Fill	0.00	0	0	1.00	-141
	FINAL					
	Excavation	0.00	0	0	1.00	
	Fill	0.28	14	14	1.00	-155
0+080.00	ORIGINAL					
	Excavation	2.51	44	44	1.00	
	Fill	0.00	0	0	1.00	-111
	FINAL					
	Excavation	0.00	0	0	1.00	
	Fill	0.03	3	3	1.00	-114
0+100.00	ORIGINAL					
	Excavation	2.58	51	51	1.00	
	Fill	0.00	0	0	1.00	-63
	FINAL					
	Excavation	0.00	0	0	1.00	
	Fill	0.01	0	0	1.00	-63

G R A N D S U M M A R Y T O T A L S

Material Name	Unadjusted Volumes (cubic meters)	Adjusted Volumes (cubic meters)	Mult Factor

ORIGINAL				
	Excavation	202	202	1.00
	Fill	0	0	1.00
FINAL				
	Excavation	0	0	1.00
	Fill	265	265	1.00

NOTE: The Project Engineer must sign here.